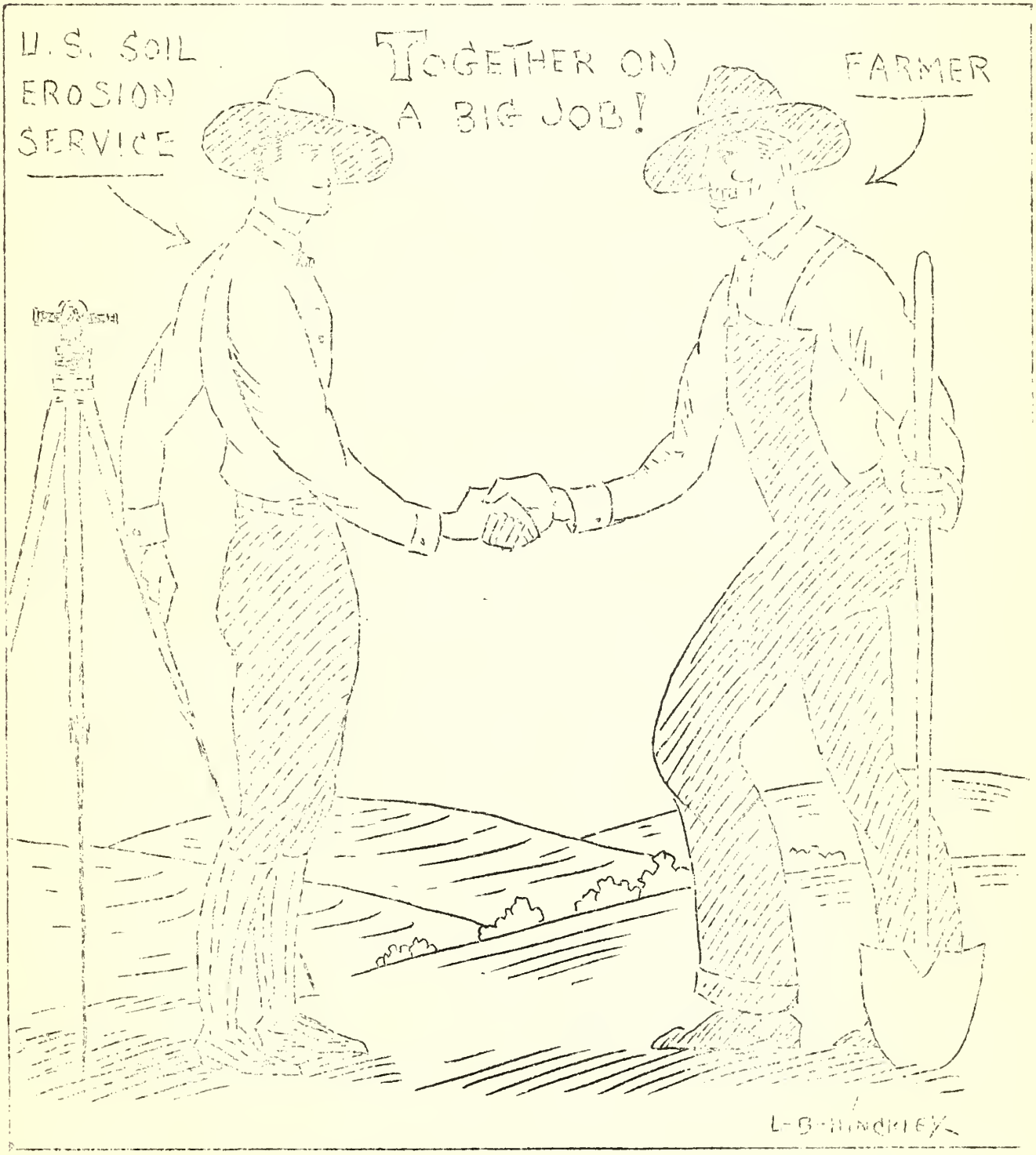
CALIFORNIA EROSION DIGEST

VOLUME I Nº 4 JANUARY 1935



HARRY E. PEDDICK
REGIONAL DIRECTOR

SANTA PAULA
CALIFORNIA

CALIFORNIA EROSION DIGEST

U. S. SOIL EROSION SERVICE, DEPARTMENT OF THE INTERIOR
Issued monthly by California Erosion Control Project

HARRY E. REDDICK, REGIONAL DIRECTOR SANTA PAULA, CALIFORNIA

Volume 1, No. 4 January 1935

ILLUSTRATED FEATURES TO BE RELEASED

The story of erosion, written in a human and dramatic manner, and illustrated with twenty line-drawings, will soon be released to key papers, both daily and weekly. I am sure that the series will give the readers a real conception of the causes of erosion, what it means to them, and how it may be controlled.

Washing of the soil from the land does not have the melodrama of a forest fire, the spine-tingling shock of a tidal wave, but it is of just as much human significance. Wearing away of the soil, bit by bit, year by year, is the most tremendous drama of all time. It lacks the fanfare and the trumpeting, but it is as inexorable in its development as an old Greek drama.

Once the people grasp the fact that the soil is as much a part of them as the air they breathe, doubt as to the value of what the U. S. Soil Erosion Service is doing will vanish. Protecting the soil will be just as much a part of our civilization as protecting other natural resources, such as the forests.

Harry E. Reddick.

SOIL EROSION SERVICE
PROJECT #7, SANTA PAULA, CALIFORNIA

Summary of work completed to January 1, 1935

	SES	FCW	TOTAL
Soil saving dams in major water courses	34	10	44
Permanent dams built	422	202	624
Head control structures built	38		38
Terrace outlets built	45		45
Terracing, miles	33		33
Ditching, diversion, drainage, lineal feet	16,125	19,461	35,586
Bank protection vegetation, square yards		36,786	36,786
Concrete bank protection bulkheads	2		2
Hole digging machine, acres	150		150
Planting, aforestation, acres		51	51
Rodent control, acres	9,521	825	10,346
Survey, linear, miles		10.3	10.3
Survey, topographical, acres		40	40
Planting for bank protection, lineal feet		22,800	22,800
Truck trails built, miles		3.7	3.7
Tree terraces, planted, lineal feet	11,000		11,000
Tree terraces, trees planted, Gradoni system	1,263		1,263
Plants and trees planted at dams, head controls, and terrace outlets	31.653		31,653
Trees and cuttings planted in barrancas	19,921		19,921
Native seeds harvested, pounds	5,725		5,725
Land planted to strip crops, acres	22.6		22.6
Land protected by strip crops, acres	365		365
Land removed from cultivation, seeded, acres	526		526
Banks sloped for planting, square yards	8,594		8,594

OTHER STRUCTURES

1 Lath house and nursery shed for propagation
75 1/100-acre experimental seed plots in area
13 2/100-acre experimental seed plots in area
6 Aliquot divisors installed
11 Hydrographic stations installed
9 Government rain gauges installed

SUMMARY OF WORK DONE TO JANUARY 1, 1935

ARROYO GRANDE ECW CAMP SES 2

Planting - forestation, acres	8
Survey, topographic, acres	150
Dams built	28
Bank protection, square yards	1,500
Ditches - drainage, diversion, etc., lineal yards	6,500
Planting for bank protection, lineal feet	9,000
Terraces - number	77
" - lineal feet	18,020

COMMENTS ON SUMMARY OF WORK

Soil saving dams are intended not only to control the extension and enlargement of a gully, but also to collect a deposit of silt. They are used principally in larger gullies where the runoff is appreciable, for which a concrete spillway or conduit is provided.

The silt deposited in the channel builds up the bottom of the water course to a point where the natural slope is reached at which the gully walls may be stabilized with a minimum loss of cultivable land in the adjacent fields. The deposit of silt and sand on more level lands below is greatly reduced.

For the prevention of the extension or enlargement of gullies, smaller dams are used. They do not, as a rule, collect an appreciable quantity of silt. A cheap type of construction - pipe, wire and asphalted burlap, or bean straw or flat rock masonry is usually used; earth fills not proving entirely satisfactory. Aprons or churn basins may be provided to prevent under cutting of the dam and deepening of the channel,but in some instances the spacing of dams may be such that the fill which accumulates in the gully above one dam extends to the foot of the next dam above, and such protection is unnecessary. Temporary dams may be used until vegetation planted can be firmly established and prevent furthe cutting. They may be washed out, however, in years of heavy runoff before protected by vegetation.

Head controls, or overfall are installed to avoid the creation or extension of gullies, where water from terraces, diversion ditches, or natural drainage is emptied into ditches or natural watercourses. They are constructed of durable materials, such as concrete, masonry or iron flume, so that there will be no danger of failure.

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Harry E. Reddick,Regional Director, and W.B. Hooper, Extension Agent, took a group of agriculturists over the demonstration area in the Las Posas on the twenty-fourth. W. H.Williams,assistant farm advisor of Los Angeles county, brought the group of 26 to Somis, the starting point for the tour.

One member of the party was particularly interested in gully control as he has a gully on his ranch 30 feet wide, which he is filling.

Among those making the tour were Z. V.Chomsky, horticulturist from Rehboth, Palestine; S. E. Goodall, of Canoga Park, Director of Los Angeles County Farm Bureaus, H. B.Griswold, of La Habra Heights, and Ray Carroll, of Pomona.

"Soil is not just dirt, but a marvelous combination of mineral nutrients and humus constituents. If rain is allowed to run off unimpeded, from clean cultivated fields, on sloping land, the soil particles, with their valuable plant foods, are lost."

--E. J. Carpenter
Chief Soil Expert.

Strong, spreading roots make the Black Locust tree a very efficient erosion stopper, according to A. E. McClymonds, chief agronomist

Richard Baker, junior agronomist, says the legume family is the second largest family of flowering plants, embracing about 12,000 species.

PERMANENT STRIP CROPPING IN CALIFORNIA

by

Harry E. Reddick, Regional Director

California rich citrus orchards being protected by bench terraces developed from permanent strips - adapting an idea from the ancients.

(Note: This article appeared in "The Land - Today and Tomorrow," Official Bulletin of the U. S. Soil Erosion Service, in the issue of December 1934.)

In spite of the indisputable marvels of the ancients in constructing their elaborate systems of terracing, California has developed a method of successfully farming steep slopes that has all their good points and lacks many of their bad ones.

The successful and continuous farming of steep hillsides has always been a major problem to the agriculturist. Steep slopes, ranging from twenty to fifty per cent in grade, have been utilized for crop production since long before the white race first practiced systematic cultivation of the land, but the methods of adapting the hillsides to production invariably called for an expenditure of labor that would be prohibitive to the modern American farmer.

The Germans, in the fertile valley of theRhine, terraced the banks up slopes so steep that the retaining walls of the plots often had more area than was made available for the growing of their grapes. The Chinese have long grown rice upon the stair step hillsides that sweep upward from the rivers. The ancient Incas of Peru (likely one of the most highly advanced agricultural people this planet has ever known) carried on their farming with a fervor that bordered on fanaticism, and built one of the most elaborate and most lasting systems of terraces of which history has any record. So successful and so foresighted were these inspired builders of land that even today, after four thousand years of continuous cropping, the same plots are supporting their descendants.

Such grand methods of land usage were not without their cost. Walls of perfectly joined masonry, six to twelve feet in thickness, and eight to twenty feet in height, were constructed by man power alone, in order to retain an area seldom exceeding a fraction of an acre. Single stones 36 by 24 feet in area and six feet thick are to be found in the walls constructed by that ancient race who had only man power, a keen appreciation of the power of leverage, and boundless energy to assist them. It is said that good rich earth was packed seven hundred miles on the backs of spindly legged llamas to carpet those precious mountain side plots which were often so small that only two rows of potatoes could be planted in their entire width.

Obviously no such methods can be used by the American farmer today, but the need of terracing on the steeper slopes is just as acute, and just as essential, if they are to be successfully cropped throughout a number of years. In California the ranchers (all farmers are known as ranchers in the West) long ago discovered that the steep slopes were often well adapted to growing of citrus fruits, avodados, and many deciduous fruits. The hillsides were often preferable because they were

UNIVERSITY OF CALIFORNIA EXTENSION SPECIALISTS AND FORESTERS TOUR CALIFORNIA EROSION PROJECTS

A tour of the U. S. Soil Erosion Project areas was made January 9th, 10th, and 11th, by W. R. Schoonover, J. B.Brown, Woodbridge Metcalf, Extension Specialists of the Agricultural Extension Service of the University of California in citriculture, irrigation and forestry respectively, in company with Regional Director Harry E. Reddick and Chiefs of of Staff of the Soil Erosion Service of California. The tour was made in order to familiarize these representatives of the Agricultural Extension Service with the amount of erosion occurring in the areas and to discuss erosion control methods in use and proposed. Accompanying the group on the tour of the Las Posas Area were E.W.Kramer, Sr., Senior Regional Engineer, U. S. Forest Service, J. D. Sinclair, Ecologist in charge U.S. Forest Experiment Station, Glendora, Calif., E.A. Kramer, Jr., Erosion Control Engineer, S. M. Munson, Erosion Control in Meadows, E. L. Hamilton, Forester.

The tours of the Las Posas and Arroyo Grande areas were curtailed by heavy rains which kept the party to hard-surfaced roads, but provided excellent graphic illustration of erosion in the making. A heavy rainfall totaling 1.36 inches and an intensity reaching .6 of an inch in 18 minutes, which is at the rate of approximately 2 inches per hour, fell four days previous to the tour. These rain-saturated soils, already wet to their water-holding capacities, caused peak flows in some of the barrancas of 900 second feet. Most of the rain which fell preceeding and during the tour of the Las Posas consequently ran off, taking with it additional soil from the hillsides. The streams in the water courses were laden with silt and the volume of flow in most instances caused cutting.

The damage to clean cultivated land was quite apparent, particularly on those fields on slopes of greater than 2 or 3 per cent, which had been chiseled or cycloned without contour subsoiling. In some instances soil to the depth of two inches had been removed from strips ten feet wide.

Strip crops which had been planted for the ultimate purpose of forming bench terraces had not in many instances made sufficient growth to prevent washing of the soil. It is doubtful whether any form of erosion control would prevent runoff with rainfall of such intensity. It was noted, however, that hillsides which had not been cultivated since harvesting the crop of beans or hay had practically no indication of loss of soil, although there had been some runoff of water. Aside from taking the land out of cultivation it seems probable that the only immediate solution for adequate control of erosion on such hillsides,under these extreme conditions, is the planting of a cover crop immediately following the harvest of the beans. If the first rains are gentle these cover crops will probably be of sufficient height and density to prevent most of the erosion which occurs with rainfalls of greater intensity. The eventual development of bench terraces with permanently vegetated risers thru permanent strip crops seems to be the only other solution of erosion control in these hillsides planted to beans.

Earth fill dams which were not completed were damaged and a number of temporary dams planted to erosion resisting vegetation and in the process of being planted were washed out. Sufficient time had not elapsed since planting for the plants to form an adequate protection from the very heavy runoff. Practically all of the permanent structures in barrancas, outlets for terraces and head controls, smaller dams in side hill gullies, completed terraces, diversion ditches and contour ditches, satisfactorily withstood the test of the large volumes of water. Strip crops had not been seeded long enough to accomplish the purpose for which they were planted, but on a few slopes they had made sufficient growth to indicate their worth.

The extent of washing in the Arroyo Grande area was not as great as following the rainfall of November 18th. Terraces, contour ditches, which had been completed in this area, satisfactorily withstood the storm. The sandy soil of the Arroyo Grande area makes necessary a steeper grade to prevent silting than is the case with most of the Las Posas soils, but a grade of 3 to 4% seems adequate to prevent silting and not sufficiently steep to cause cutting, which occurs when large volumes of water flow down diversion or outlet ditches.

In the Corralitos area the results of the storm of November 18th were still visible, although vegetation was rapidly covering many of the scars, and progressive land owners were rapidly repairing the damage.

From the standpoint of demonstrating the degree and amount of erosion which can occur in periods of heavy rainfall the tour was an unqualified success.

--W. B. Hooper.

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Glenn L.Fuller, chief erosion specialistffrom Washington, D.C., and E. J. Carpenter, chief soil expert of California projects, are in Safford, Ariz.

One of the most interesting things observed in connection with our work came to my attention the past week. I was working out the plans for the farm of Walter Crowder, one of our colored farmers who lives west of Whites Store near Union County line. We came to a fairly large and active gully in the edge of one field. I noticed that some one had made considerable effort recently to check the erosion in this gully. I was just about to compliment the owner for his efforts when he stopped me and surprised me by saying that the work had been done by his two small sons. The oldest of the two is only eleven years old and the other just old enough to follow him around. They had planned the work all by themselves and had completed the job before the father knew anything about it.

During the early summer these boys had visited a nearby farm where a CCC crew was doing gully work. They had observed the work and gone back home and tried as best they could to duplicate what they had seen. They got enough poles together from somewhere to put three dams across the gully and put some brush in the bottom of the gully. Of course, the big rains we have had checked the erosion enough for some grass to get started in what had been a bare and active gully. Our hope is that thousands of other farm boys and girls will soon become as interested as these two boys and join with their parents and their government in a great campaign to fight and conquer this terrible menace of soil erosion before it is too late.

--The Brown Creek Watershe
January 15, 1935.

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Glenn L. Fuller, chief erosion specialist from Washington, D. C. was at local headquarters in Santa Paula the twenty-eighth and twenty-ninth.

SCREENINGS FROM A RUN-OFF

In an address in Ohio H. H. Bennett, Director of the U. S. Soil Erosion Service, asserted that present flood control measures are inadequate and ineffective, because they fail to strike at the root of the flood problem. Until a scientific effort is made to halt erosion and surficial runoff of rain water "on the slopes where floods really originate," he declared, "there can be no permanent control of flood."

Such a program, scientifically executed, Mr. Bennett stated, would automatically reduce the volume of flood waters by twenty-five per cent and hold the hazard of flood to an absolute minimum..... "Until we strike at the critical points of accelerated runoff from cultivated and overgrazed slopes where floods really originate and silt loads are picked up -- we shall never have any approximation of permanent flood control or any important reduction of the hazard of silting."

Mr. Bennett estimated the potential future value of erosion control demonstrations now being carried out by the Soil Erosion Service at approximately five billion dollars.

Recent investigations, Mr. Bennett stated, have revealed that not less than one hundred million acres of formerly cultivated land in this country have been essentially ruined by erosion. This is the equivalent of 625,000 160-acre farms - an area nearly equal to the combined extent of Ohio, Illinois, Maryland, and North Carolina. Isolated fields and small parcels of ground between gullies can still be cultivated on a patch-farming basis, but fully half of the area is physically unfit for cultivation because of gullies.

"In addition, 125 million acres of the land now in cultivation has lost all or the greater part of the top soil and, as the result, these denuded lands are from two to ten times less productive than was the virgin soil. They are not only less productive - they are more difficult and expensive to plow; rain water flows over the exposed impervious clay more rapidly to increase the rate of erosion, the rate of silting of stream channels and reservoirs and the height of floods."

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Staff meeting on January seventh turned out to be highly interesting. Ralph Bennett read a paper written by E. J. Carpenter on "Outline of Early Soil Investigations." Carpenter was away attending a conference of soil erosion experts in Mississippi. Leonard Wohletz gave a talk on soil terms. Now, when the soils men talk about the "A"-horizon, et cetera, we will know they are not talking about the beauties of nature. Howard Gabbert explained the relation of geology to soil formation. After listening to the millions of years that are necessary for geological changes we are not so impressed by our great grand dad's boast that "I'll be 99 years old next Fourth of July."

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Prof. Shaw, of the University of California, and head of the department of soils there, was a recent visitor.

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Our new Chief Clerk hails from Virginia. Mr. Burke Bennett is the name.